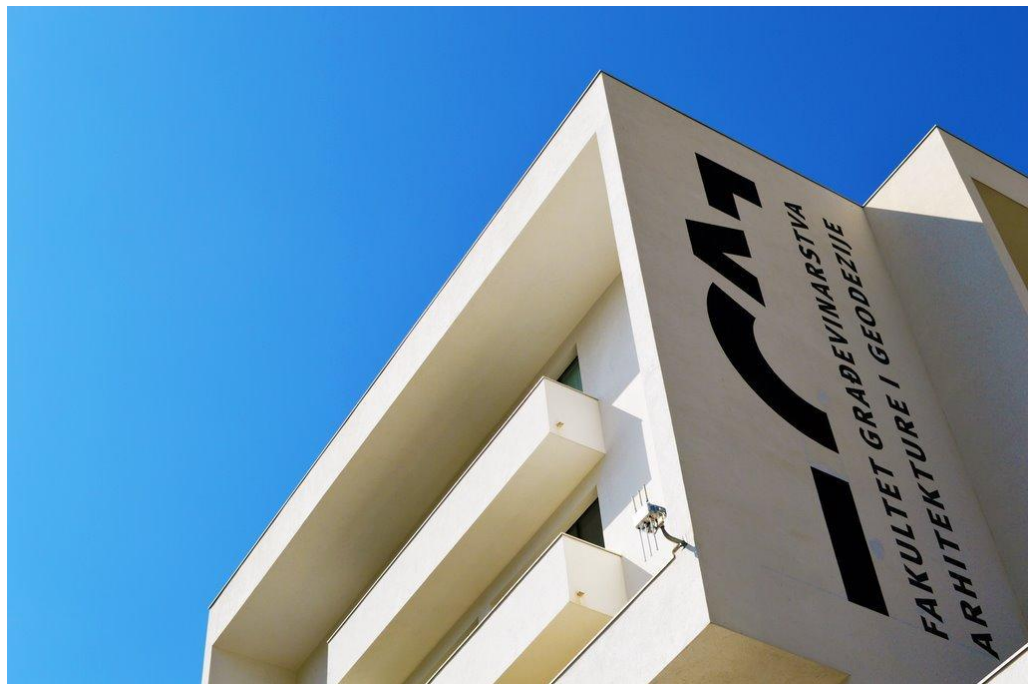




SVEUČILIŠTE U SPLITU,
FAKULTET GRAĐEVINARSTVA,
ARHITEKTURE I GEODEZIJE

STRATEGY

of the Faculty of Civil Engineering,
Architecture and Geodesy,
University of Split
for the period 2023-2027



Split, February 2024

The development strategy of the Faculty of Civil Engineering, Architecture and Geodesy in Split (FCEAG) for the period 2023-2027 was prepared by members of the Faculty Board, members of the Faculty Council, researchers, teachers, associates, employees and students of the Faculty and relevant external stakeholders from the regional and Croatian industry, as well as representatives of local and regional self-government.

The strategy is based on the analyses of Faculty capacities (teaching and scientific research capacity, community engagement capacity, infrastructure capacity), evaluation of the results of previously set goals in the strategy for the period 2018-2022, and current objective circumstances, taking into account other relevant strategic documents of the Faculty (Strategic programme of FCEAG scientific research for the period 2021 - 2025 in the field of engineering sciences and interdisciplinary field of science), corresponding documents of the University of Split and documentation created at regional, national, and European levels.

The development strategy defines goals, activities, and performance indicators for the period 2023-2027, established in the context of latest knowledge and the current environment of the Faculty, representing the setting of Faculty activities and its societal role in the region, Croatia and the EU.

The strategy was developed during 2023 and adopted at the 5th regular session of the Faculty Council on 28 February 2024.

The terms used in this document are gender neutral.

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Annex 1

Overview of the analyses of FCEAG teaching and scientific capacity and community engagement capacity

Annex 2

Overview of the achievement of objectives established in the preceding Strategy and achieved through the planned activities

1. Introduction

Faculty history overview

The Faculty of Civil Engineering, Architecture and Geodesy in Split is a higher education institution that commenced its operations in the fall of 1971 as the Department of Civil Engineering and part of the University of Zagreb. It started its autonomous work in 1977 and became an independent higher education and scientific research organisation in July 1991 when it separated from the Civil Engineering Institute.

In anticipation of the full development of the Dalmatian region, the need to establish study programmes in urban planning and architecture emerged. The establishment of the study was initially made several times, but it was finally opened in 2003 on the initiative of the University of Split and the Faculty of Civil Engineering in Split. The founding cycle was completed in the academic year 2008/2009 and the first generation of enrolled students graduated. In the academic year 2010/11, four decades after the initial idea and after several years of preparation, the Study of Geodesy and Geoinformatics was established with the assistance and support of the University of Split and the Faculty of Geodesy in Zagreb. The Faculty was then renamed to its current title: Faculty of Civil Engineering, Architecture and Geodesy (FCEAG).

From the first day, FCEAG operated in its premises (buildings A and B) in 6,800 square metres of usable space for classrooms, cabinets, laboratories, library, council hall, and computer rooms. A new building C was built and fully equipped, with a total area of 1,600 square metres. In September 2021 the capital project for the construction and equipping of new laboratory premises was completed (project "Implementation of Contemporary Scientific Research Infrastructure at FCEAG for Smart Specialization in Green and Energy Efficient Construction KK.01.1.1.02.0027" worth EUR 11.2 million – INFRA project). In general, the recently completed laboratory facilities are adequate for the Faculty operations and implementation of study programs.

Considering that Split is a Mediterranean and coastal city, current trends in civil engineering focus on construction in karst areas and on the coast. Great financial, organisational, and intellectual efforts are required to achieve sustainable development goals in a coastal environment. Civil engineering, architecture, urban planning, and cognate disciplines play a leading role in such endeavours and become more efficient when synthesised with other areas, skills, and fields of knowledge. Therefore, current scientific research topics at FCEAG include several other disciplines of science, reflecting the need to expand the activities of the institution into new research areas. The priority issues concern the advancement of the management of the existing built environment, natural resources and environmental protection, and sustainable construction in general.

Faculty activities

Teaching, scientific research, and professional activities have been one of the basic drivers of the Faculty's development since its inception. The current record, achieved over the past five decades, places FCEAG among the leading engineering sciences faculties in Croatia and the region.

The study programs offered at FCEAG provide students with a comprehensive education in several civil engineering disciplines at the graduate level: general (transportation engineering, geotechnical engineering and organisational topics), water resources engineering, construction technology, in the field of architecture and urban planning, as well as geodesy and geoinformatics. Furthermore, the Faculty offers a postgraduate (doctoral) study program in all core civil engineering and core engineering disciplines or branches.

Adaptation of the Faculty through its core activities and research topics recently manifested as reorganisation of scientific and research activities in the form of conforming the Faculty structure to

contemporary scientific and research trends (by forming a matrix organisational structure of the Faculty, creating a project-orientated organisation of scientific and research activities within the traditional functional organisational structure that is more suitable for other Faculty activities). In addition to 22 departments composed of teachers and associates of correlated courses, 11 science and arts research logical units (SARLU) were formed, bringing together researchers and artists on related topics. The FCEAG laboratory consists of 11 specialised laboratory units (LU), mainly tasked with supporting the related SARLU research group. Two bodies assist the dean: Department Heads Assembly supports the activities related to teaching, and the SARLU Heads Assembly supports the scientific research and artistic activities and FCEAG laboratory management.

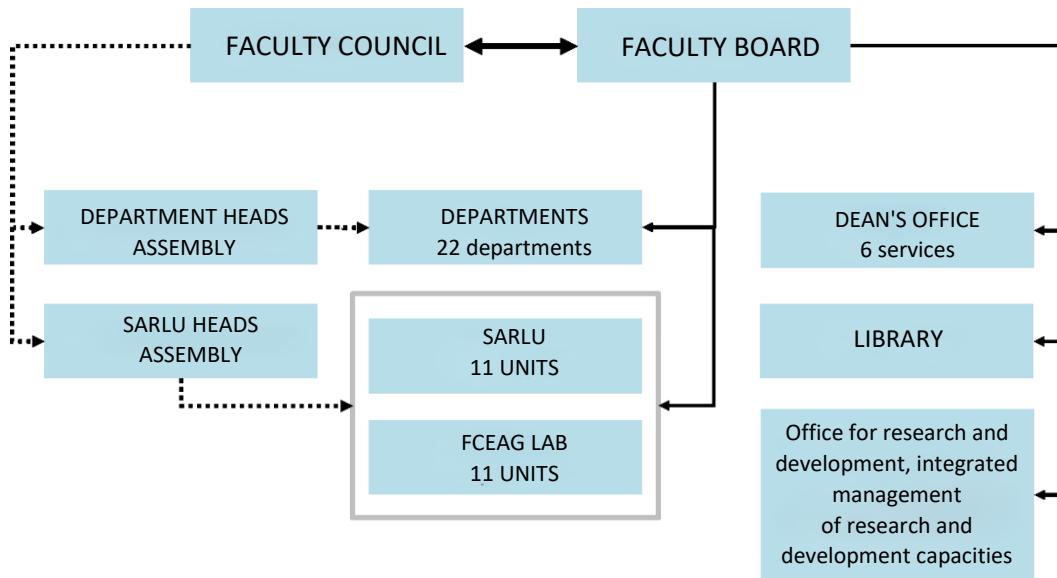


Figure 1. FCEAG organisational structure

Since research is closely connected to professional work and activities in the industry, this correlation resulted not only in highly relevant scientific work, but also in the design and construction of many significant buildings and projects, which is why the Faculty stands out as an institution representing professional and scientific excellence.

In addition to scientific research, higher education and lifelong learning programmes organised through professional development courses, FCEAG offers professional engineering services, such as study preparation, expert studies, design supervision studies, preliminary designs, complex structural designs, construction site and design supervision, laboratory and field structural testing, and expert consulting.

Quality audit cycles

In the previous cycles of quality audit, FCEAG completed the re-accreditation procedure for the postgraduate university (doctoral) study in Civil Engineering in 2016 and the re-accreditation procedure for other study programs of the Faculty in 2018. The doctoral study program in Civil Engineering was awarded with the excellence certificate by the international accreditation board of the Croatian Agency for Science and Higher Education, confirming the value of the offered doctoral program as one of the few study programs in Croatia with excellent external evaluation results.

Taking into account the relevant strategic documents at the EU level [1] and at the national level [2-7], the University of Split Strategy [8, 25], and the FCEAG Strategy [9-11] and according to the positive results of previous quality audits [12-18], the current strategy is adopted to continue the steady development trend of established Faculty activities (teaching, scientific research and artistic activities, professional activities, community engagement and management of infrastructure and human resources management).

2. Analysis of the current situation and institutional capacities

2.1. Teaching capacities

The Faculty of Civil Engineering, Architecture and Geodesy has a high capacity to implement teaching activities, as confirmed by the data regarding the teacher/student ratio (Table 1) and the analysis of the number of teachers in specific teaching areas (Table 2).

During the last 5 years (2018 – 2022), FCEAG has implemented four Erasmus+ projects and three ESF projects from the Operational Programme "Development of Human Resources", using the funds to improve the educational system. The Faculty is recognised as a valuable partner in cooperation activities with foreign higher education institutions. (Annex 1, Table P1.2)

Analysis of the number of teachers who are able to teach courses in English indicates a significant international teaching potential of the Faculty in all scientific and artistic fields (Annex 1, Table P1.1).

Table 1. Teacher/student ratio (average for the period 2018-2022)

	University studies Civil Engineering	University studies Architecture and Urban Planning	University studies Geodesy and Geoinformatics	Professional studies Civil Engineering	Cumulative relation
Assistants	9,60	4,92	3,90	2,72	21,14
Teachers	32,70	21,00	8,20	10,05	71,95
In total	37,50	23,46	10,15	11,41	82,52
Students	473,20	241,6	142,2	134,2	991,20
Students/Teac.	14,47 / 1	11,50 / 1	17,34 / 1	13,35 / 1	13,78 / 1
Students/Total	12,62 / 1	10,30 / 1	14,00 / 1	11,76 / 1	12,01 / 1

Table 2. Number of teachers covering specific teaching areas (academic year 2021/2022)
(C-civil engineering, A-architecture, GG-geodesy and geoinformatics)

Core areas of study	Number of teachers covering the area	Outcome volume ECTS in the area and number of teaching hours (norm-hours)	Coverage assessment	Planned mitigation measures
Hydrotechnical Engineering	Assistants 3 Sci.-tea. titles 8	204 ECTS/783 hrs lect.; 861 hrs ex.; 321 hrs sem./C +3 ECTS/15 hrs lect.; 30 hrs sem./GG + 2 ECTS/ 30 hrs lect.; 15 hrs ex./A	Area covered	
Structural Engineering	Assistants 10 Sci.-tea. titles 18	356 ECTS/1454 hrs lect.; 2372 hrs ex./C +24 ECTS/150 hrs lect.; 285 hrs ex. /A	Area covered	
Engineering Mechanics	Assistants 1 Sci.-tea. titles 2	35 ECTS/165 hrs lect.; 360 hrs ex.; 39 hrs sem./C	Area covered	
Geotechnical Engineering	Assistants 0 Sci.-tea. titles 3 External assoc. 2 (Sci.-tea. titles 1 and teaching title 1)	66,5 ECTS/233 hrs lect.; 429 hrs ex.; 94 hrs sem./C	Area partially covered; external teachers involved (geology)	Employment of teachers with sci.-tea. titles for geology courses
Transportation Engineering	Assistants 1 Sci.-tea. titles 2 External assoc. 1 (teaching title)	68 ECTS/180 hrs lect.; 285 hrs ex./C +2 ECTS/30 hrs lect.; 45 hrs ex./A +5 ECTS//30 hrs lect.; 60 hrs ex./GG	Area covered	
Construction Management and Economics	Assistants 1 Sci.-tea. titles 3 External assoc. 3 (2 Sci.-tea. titles 1 teaching)	89 ECTS/370 hrs lect.; 90 hrs ex.;/C +8 ECTS/75 hrs lect.; 30 hrs ex.; 15 hrs sem./A +4 ECTS/15 hrs lect.; 15 hrs ex./GG	Area covered	
Construction Materials	Assistants 0 Sci.-tea. titles	35 ECTS/144 hrs lect.; 267 hrs ex.; 110 hrs sem./C	Area partially covered	Employment of a new teacher to cover exercises
Natural Sciences and IT (Mathematics, Physics, Geometry, Computer Science)	Assistants 5 Sci.-tea. titles 5 Teaching titles 3 External assoc. 2	68.5 ECTS/ 645 hrs lect.; 1365 hrs ex. /C +14 ECTS/ 90 hrs lect.; 150 hrs ex. /A +27 ECTS/ 180 hrs lect.; 180 hrs ex. /GG	Area covered with the engagement of external teachers	
Architectural Design	Assistants 1 Sci.-tea. titles 1 Art.-tea. titles 8 External assoc. 18	132 ECTS/600 hrs lect.; 3270 hrs ex./ A	Area insufficiently covered; large number of external teachers engaged	Employment of new teachers and reducing the engagement of external teachers
Architectural Heritage	Sci.-tea. titles 1	14 ECTS/ 90 hrs lect.; 90 hrs ex./ A +2 ECTS/ 30 hrs lect.; /C +3 ECTS/ 30 hrs lect.;/ GG	Area covered	

Core areas of study	Number of teachers covering the area	Outcome volume ECTS in the area and number of teaching hours (norm-hours)	Coverage assessment	Planned mitigation measures
Theory and History of Architecture and Art	Assistants 1 Sci.-tea. titles 1 External assoc. 2	17 ECTS/210 hrs lect.; 210 hrs ex. /A	Area covered with the engagement of external teachers	
Urban Planning	Assistant 1 Sci.-tea. titles 2 Art.-tea. titles 1 External assoc. 3	33 ECTS/270 hrs lect.; 495 hrs ex.; 30 hrs sem. /A +2 ECTS/30 hrs lect./GG	Area covered with the engagement of external teachers	
Buildings	Assistant 1 Sci.-tea. titles 3 External assoc. 3	28 ECTS/235 hrs lect.; 360 hrs ex./A +26 ECTS/150 hrs lect.; 210 hrs ex./C	Area covered with the engagement of external teachers	
Geodesy	Assistants 3 Sci.-tea. titles 3 External assoc. 7 (Sci.-tea. titles 6 and 1 assoc.)	77 ECTS/460 hrs lect.; 890 hrs ex./GG +10 ECTS/60 hrs lect.; 150 hrs ex./C	Area insufficiently covered; large number of external teachers engaged	Employment of new teachers and reducing the engagement of external teachers
Geoinformatics	Assistants 3 Sci.-tea. titles 2 External assoc. 6 (Sci.-tea. titles 1 and 5 assoc.)	79 ECTS/375 hrs lect.; 620 hrs ex./GG GG +5 ECTS/30 hrs lect.; 30 hrs ex./C	Area insufficiently covered; large number of external teachers engaged	Employment of new teachers and reducing the engagement of external teachers
Foreign Languages	External assoc. 1	11,5 ECTS/30 hrs lect.; 30 hrs ex.; 30 hrs sem./G +3 ECTS/15 hrs lect.; 15 hrs ex./GG +1 ECTS/ 15 hrs lect.; 15 hrs ex./A	Area covered	

2.2. Scientific capacities

The Faculty of Civil Engineering, Architecture and Geodesy has a high research capacity in all core areas of science, as confirmed by the number of relevant scientific publications in the past five-year period (Table 3) and the assessment of the supervisory and research capacity of projects in which FCEAG participated as project developer or project partner (Annex 1, Table P1.3).

Currently, six ERDF projects are implemented at FCEAG, as part of the Operational Programme "Competitiveness and Cohesion 2014-2020". INFRA, infrastructural project for the construction, adaptation and equipping of new Faculty laboratory premises titled "Implementation of Contemporary Scientific Research Infrastructure at FCEAG for Smart Specialization in Green and Energy Efficient Construction" was completed in 2021. The successful implementation of this project significantly improved the scientific and research infrastructure capacity of FCEAG, by securing equipment for 11 research units. The project increased the recognition of FCEAG, improving networking opportunities at all levels. At the same time, in the period 2014-2020, seven ERDF – INTERREG projects were completed. Furthermore, in the period 2018-2022, three projects financed by the Croatian Science Foundation were completed, while three more are currently in progress. A list of all scientific research projects with a more detailed assessment of research visibility and impact is presented in Annex 1, Table P1.3.

Table 3. Research results, relevance and recognition of the Faculty in specific areas of science (supervisory and research capacity by area)

Core areas of study	Number of relevant publications in the approx. past 5 years	Relevance of FCEAG in this area; number of citations (self-citations)	Recognition assessment
Structural Engineering and Engineering Mechanics	A = 78 B = 9 C = 32 Total = 119	WoS (81 papers in total): 362 (98) Scopus (118 papers in total): 707 (213)	The area is well recognised (with a respectable number of researchers)
Hydrotechnical Engineering	A = 90 B = 34 C = 21 Total = 145	WoS (102 papers in total): 716 (115) Scopus (114 papers in total): 842 (216)	The area is well recognised (with a respectable number of researchers)
Construction Management	A = 5 B = 1 C = 6 Total = 12	WoS (23 papers in total): 90 (12) Scopus (26 papers in total): 125 (24)	Area recognised, small number of researchers
Geotechnical Engineering, Transportation Engineering and Construction Materials	A = 34 B = 14 C = 36 Total = 84	WoS (58 papers in total): 345 (49) Scopus (60 papers in total): 402 (133)	The area is well recognised.
Architecture and Urban Planning	A = 6 B = 10 C = 11 Total = 27	WoS (9 papers in total): 4 (1) Scopus (5 papers in total): 3 (1)	The area is developed more in the artistic direction
Geodesy and Geoinformatics	A = 19 B = 1 C = 34 Total = 54	WoS (41 papers in total): 125 (19) Scopus (45 papers in total): 163 (27)	The area is well recognised.
Natural Sciences	A = 35 B = 5 C = 3 Total = 43	WoS (36 papers in total): 168 (31) Scopus (38 papers in total): 175 (108)	The area is well recognised.
Interdisciplinary Areas	A = 17 B = 0 C = 1 Total = 18	WoS (17 papers in total): 93 (14) Scopus (18 papers in total): 122 (21)	The area is well recognised.

A = scientific papers published in journals indexed in WoSCC (*Web of Science Core Collection*)

B = scientific papers published in journals indexed in other bibliographic databases

C = scientific papers published and presented at international conferences/posters

2.3. Community engagement capacities

The Faculty of Civil Engineering, Architecture and Geodesy has a high community engagement capacity, largely achieved through the activities within many implemented projects. FCEAG participated as a partner in seven projects implemented within the cross-border cooperation programme INTERREG V-A Italy - Croatia 2014-2020, and in two projects implemented within the Interreg Mediterranean programme. The participation of researchers from FCEAG in Interreg projects is well-recognised, and the research is disseminated both within the academic community and through media outlets, focused on the industry and the wider community. The participation of FCEAG researchers in these projects created a framework for the cooperation and application of new projects. The potential of FCEAG for cooperation with public bodies and the potential of creating new and improving existing regulations have been recognised. Furthermore, in the capacity of project developer or project partner, FCEAG implemented nine projects cofinanced by the European Regional Development Fund, Operational Programme Competitiveness and Cohesion 2014-2020. Through these projects, FCEAG became recognised in the promotion of research and established its position as a prospective partner to create new partnerships in the EU and the Republic of Croatia. The implementation of these projects created a framework for a significant increase in the capacity to cooperate with the local community. The results of these projects were distributed to stakeholders in the local government. As part of the projects, a patent application was filed, proposing an innovative concept for a wide range of stakeholders. Furthermore, cooperation was established with four companies having long-term experience in research: DIV, KONČAR EU, ADRIA WINCH and KLIMA OPREMA. Through projects financed from the European Social Fund, a contribution was made in the area of enhancing professional training programmes, promoting faster integration of students into the labour market, and improving cooperation between the industry and the research sector. A complete list of all projects with a more detailed description of the partnership engagement areas is presented in Annex 1, Table P1.4.

Project activities enhanced the cooperation between FCEAG and the academic and business community at the national and international levels, creating a network for cooperation in all areas of Faculty research activities. An overview of the cooperation with foreign partners with a more detailed description of collaborative areas is given in Annex 1, Table P1.5.

For the purpose of community engagement, FCEAG continuously carries out activities to promote Faculty core research (Annex 1, Table P1.6). In the previous period, significant breakthroughs have been made in cooperation with the market, transfer of knowledge and innovations. The results are apparent, as shown by many contracts and agreements, as well as joint applications for projects with economic operators. A detailed list of partner economic operators is presented in Annex 1, Table P1.7.

FCEAG is also involved in the activities of local communities and the development of the economy, through a wide range of professional projects, including cooperation in the preparation of strategies for the development of surrounding cities, infrastructure construction projects, and the preservation of the environment and cultural heritage. An overview of the selected projects is presented in Annex 1, Table P1.8.

3. Analysis of the achievement of objectives for the previous period (2017-2022)

The strategy of the Faculty of Civil Engineering, Architecture and Geodesy for the previous period 2017-2022 defined ten strategic objectives for seven established principal areas (teaching activities, students, scientific research activities and international recognition, artistic activities, community engagement, human resources management and quality assurance). A summary of the analysis of the achievement of the strategic objectives from the previous strategy is presented below, while a detailed statement of the achievement of the subgoals with associated activities is presented in Annex 2, tables P2.1. to P2.7.

STRATEGIC OBJECTIVE 1

Improve the compatibility of teaching programs with European programs. Constantly improve the existing programs and introduce new undergraduate, graduate and postgraduate programs, that are recognisable and attractive to students, with clearly defined learning outcomes and consistent with the long-term needs of the community, the economy and the development of society.

The strategic objective has been largely achieved. Additional efforts are necessary to improve the existing study programs and activities that will lead to an increase in the efficiency of studying and an increase in the number of successful students in all study programs.

STRATEGIC OBJECTIVE 2

Continuously develop the student standard, provide a pleasant and stimulating environment for quality and efficient studying, applying the principle of equal opportunities for all students

The strategic objective has been achieved according to the set performance indicators of the previous periods.

STRATEGIC OBJECTIVE 3

Increasing recognition in the European Research Area, as the scientific research activities of FCEAG contribute to the development of the region, the Republic of Croatia and the EU

The strategic objective has been largely achieved. As a result of the significant increase in research funding from EU funds, the level of recognition of FCEAG scientific research activities in the European Research Area is increasing. However, it is necessary to continue working on the international recognition and relevance of the study programs.

STRATEGIC OBJECTIVE 4

FCEAG develops and encourages interdisciplinary research

The strategic objective has been partially achieved. Continuous efforts should be directed at increasing the number of interdisciplinary research, especially through cooperation activities with other national and international scientific research institutions and economic operators.

STRATEGIC OBJECTIVE 5

Strengthening international cooperation and mobility

The strategic objective has been largely achieved. Several subgoals were not achieved partly due to circumstances related to the COVID-19 pandemic.

STRATEGIC OBJECTIVE 6

Strengthening of infrastructure capacities

The strategic objective has been achieved according to the set performance indicators of the previous periods, primarily through the successful implementation of the INFRA project. In the upcoming period, efforts should be directed towards ensuring the sustainability of the achieved infrastructure capacities.

STRATEGIC OBJECTIVE 7

Advancing the recognition of the Faculty of Civil Engineering, Architecture and Geodesy by high standards in artistic creativity in the field of architectural and urban design and planning, proven by excellent results achieved by professors and students on a national and international level

The strategic objective has been largely achieved. In the upcoming period, efforts should be directed towards working on the internationalisation of artistic and teaching activities.

STRATEGIC OBJECTIVE 8

Continuously develop the relationship with the community and contribute to the improvement of the competences of society and the economy

The strategic objective has been largely achieved. In the upcoming period, efforts should be directed towards working on cooperation with alumni associations and improving the lifelong learning system.

STRATEGIC OBJECTIVE 9

Continuously improve organisational development and the human resources management system

The strategic objective has been largely achieved. In the upcoming period, efforts should be directed at further improving the system of motivating and rewarding employees.

STRATEGIC OBJECTIVE 10

The quality assurance system is an integral part of all the activities of the Faculty involving all the stakeholders.

The strategic objective was achieved according to the set performance indicators of the previous periods.

4. SWOT analysis

Reasons for not achieving the set objectives serve as a basis for assessing weaknesses and threats. Opportunities and strengths are found in emerging objective circumstances and previously achieved objectives.

4.1. SWOT analysis of teaching activities

Strengths (internal factors):

- high teaching capacity of the Faculty (student-teacher ratio at the Faculty level 12:1; high coverage of teaching areas; high international capacity of teachers)
- continuous application to projects and implementation of projects aimed at improving teaching activities
- organising workshops and lectures to improve teacher competencies
- professional training is carried out in all study programs in cooperation with work-integrated learning partners
- organising fieldwork teaching for all study programs (visits to construction sites in Croatia, tours of historical urban sites and renowned architectural projects)
- increased inter-university mobility of students and teachers
- development of capacities for the application of e-learning (teacher capacities, IT equipment)
- development of an online library (catalogue and online browsing of books and journals)
- development of scientific and artistic capacities (staff and equipment), enabling student participation in scientific and artistic activities
- development of professional activities enables student participation in concrete tasks of social importance
- participation of students in national and international exhibitions
- rewarding the best students
- plagiarism detection software available
- developed teaching quality monitoring system
- continuous improvement of teaching according to the recommendations of the evaluation procedure (action plan implementation)
- student support provided by the Careers Office
- large number of students involved in cultural and artistic, sports and humanitarian activities
- active student body (range of activities, from monitoring the quality of teaching to applying for student projects)
- student residential and extracurricular activities in the facilities of the student campus
- improving teaching through the further application of the results of the LABIRINT project (development of professional standards, qualifications and study programs in the field of geodesy and geoinformatics) and the PRAG project (strengthening of professional training in the teaching process, IT platform for cooperation with alumni members)

Weaknesses (internal factors):

- one part of teachers has an increased teaching load and a large number of students
- the study programs Geodesy and Geoinformatics, and Architecture and Urban Planning, as well as geology courses at all study programs in Civil Engineering are not covered by employed teachers

- insufficient number of assistants for the implementation of the teaching process (in order to improve performance, it is required to have a smaller number of students in groups)
- lack of development job positions engaged in work with students at renovated and new laboratories
- increasing administrative obligations hinder teaching and scientific work
- insufficient number of specialised classrooms (computer classrooms, studios and model workshops)
- low level of student mobility (within the University)
- procedures for detecting plagiarism and copying are not defined
- procedures for monitoring the harmonisation of workload and ECTS credits are not carried out
- teacher engagement with ERASMUS students is not evaluated
- regulations for evaluating and rewarding the excellence of teachers are not introduced
- insufficient cooperation with institutions such as chambers and professional associations in establishing a permanent system of improving learning outcomes through regular review of study programs
- academic success rates are not increasing
- low international recognition of study programs in English

Opportunities (external factors):

- defining strategic objectives at the national level and introducing programme funding
- financing of higher education development projects from national and EU funds
- activities at the university level that contribute to the quality of teaching at the Faculty (student ombudsman, public outreach campaigns, etc.)
- Faculty participation in the activities of the SEA-EU European University of the Seas with the aim of strengthening teaching capacities, reviewing study programs, increasing international visibility, etc.
- Faculty cooperation with self-government (cities, municipalities, counties) and economic operators on development projects with the aim of developing teachers' professional competencies and identifying needs for new learning outcomes
- Faculty participation in scientific and infrastructural projects within the framework of national and EU funds can contribute to the modernisation of the teaching process
- networking with Croatian universities and institutes (exchange of experiences and joint application of projects)
- networking with European universities and institutes (ERASMUS exchange programme)
- establishing collaborations resulting from implemented teaching improvement projects

Threats (external factors):

- relocation of young people from Croatia (loss of students) and human capital flight, i.e. relocation of students after completing undergraduate studies
- high teaching load standards
- lack of funds for fair evaluation of overtime work
- the competent ministry is not fully responsive to demands resulting from system changes (institutional share of funds for EU projects, technical staff in laboratories, etc.)
- other stakeholders are not overly active in the process of developing occupational standards and qualifications in the civil engineering industry
- interdisciplinary study programs are not recognised by professional chambers and legislation
- low interest of students from Croatia to study in English
- fluctuations in labour market demands for construction, architecture, geodesy and geoinformatics engineers, resulting from economic conditions in the civil engineering industry

4.2. SWOT analysis of scientific research activities

Strengths:

- major scientific research assets resulting from the implementation of the INFRA project, based on 11 recently equipped specialised laboratory units
- reformed organisational structure, SAR logical units, Office for research and development, joint management of research and development capacities
- human resources potential for implementation of national and international research projects
- continuous application and implementation of research projects funded by national and EU funds [19]
- long-term implementation of postgraduate (doctoral) study at FCEAG (since 1992)
- cooperation with other faculties and research groups in Croatia and abroad (visiting professors, international projects, joint doctorates, joint publications and projects and other forms of cooperation)
- continuous organisation of workshops and summer schools for doctoral students
- opportunities of investments in research equipment resulting from projects with economic operators
- established tradition of publishing scientific papers in reputable journals
- increase in the number of papers published each year in journals cited in the WoS database in the areas of construction, architecture, and geodesy in Croatia [20]
- continuous publication of the scientific journal "International Journal for Engineering Modelling" [21]
- plagiarism detection software available
- cooperation with institutes and leading companies on large-scale, capital-intensive projects

Weaknesses:

- insufficient national and international visibility and recognition of the Faculty's scientific capacities
- lack of options and experience of FCEAG researchers in finding partners for building consortia for Horizon Europe project applications
- one part of researchers is burdened with excessive teaching workload or institutional obligations
- insufficient utilisation of multidisciplinary and interdisciplinary scientific research potentials of FCEAG
- insufficient mobility of postgraduate students (doctoral students)
- small number of doctoral students
- insufficient number of laboratory staff
- insufficient knowledge transfer (no registered patents, start-up and spin-off companies)
- regulations are not introduced for evaluating and rewarding employees for excellent achievements in the development of the Faculty's scientific and research infrastructure

Opportunities:

- defining strategic objectives at the national level and introducing programme funding
- EU structural projects available to Croatia for the infrastructural development and procuring laboratory equipment
- university-level initiatives for international collaborations/projects
- Faculty participation in the activities of the SEA-EU European University of the Seas with the aim of strengthening research capacities and increasing international visibility
- networking with research institutes and centres in Croatia and abroad
- initiated collaborative research with other research groups in Croatia, the EU, Japan and the USA
- applicability of FCEAG research in the industry / R&D projects

Threats:

- loss of young researchers/doctoral students due to human capital flight, i.e. relocation of young people from Croatia
- limited funding sources for scientific research at the level of the Republic of Croatia
- high costs of laboratory research

- administrative tasks in daily work, especially related to preparing documentation for project proposals and project reporting
- low recognition of the interdisciplinary field of research and difficulties in creating conditions for development of the field at the national level

4.3. SWOT analysis of artistic activities

Strengths:

- successful participation in architectural and urban planning competitions on a national and international level
- successful solo exhibitions and participation in invitational exhibitions on the national and international level
- publishing research in reputable architectural publications, books and journals
- participating in architectural and urban planning workshops in Croatia and abroad (extracurricular activities of the faculty, summer schools, EU projects workshops, etc.)
- high level of recognition of excellence confirmed by national and international awards
- artistic activities at the Faculty implemented by artist groups as part of SAR projects

Weaknesses:

- high teaching workload
- insufficient number of junior associates in the existing financing system
- lack of capacity to attract international funding for projects in the artistic field

Opportunities:

- university-level initiatives for international collaborations/projects
- collaborative projects with other related faculties in Croatia and abroad
- collaborative projects initiated by the Association of Croatian Studies of Architecture and Urban Planning

Threats:

- limited opportunities to employ quality staff, especially young people, since the private sector can offer much better benefits than the Faculty

4.4. SWOT analysis of community engagement

Strengths:

- continuous application and implementation of a large number of cooperative projects with the community, financed from national and EU funds
- a large number of signed cooperation agreements (with universities and faculties, institutes, public administration and companies)
- enabling other research organisations and companies to use Faculty scientific and research equipment on their projects (catalogue and price list prepared)
- good cooperation with Dalmatian counties, cities, and municipalities
- significant contribution to activities of competent standards development organisations, ministries, and chambers
- participating in the activities of national and international associations, and knowledge exchange platforms
- involvement in university-level science communication and public engagement initiatives

- active engagement with the social community through the FCEAG Open Doors Days and the FCEAG Job Fair
- readiness of alumni community members to cooperate with the Faculty
- increased number of work-integrated learning partners and the number of students who achieve part of the learning outcomes in work-integrated learning centres

Weaknesses:

- lack of funding resources for networking and finding partners for active researchers in the industry sector
- teaching and research workload of employees prevents greater engagement in development of community projects and studies, or work on complex structures and systems projects
- regulations are not introduced for evaluating and rewarding the employees for special achievements in highly complex professional projects
- insufficient number of professional institutions that could successfully market FCEAG's research topics and ideas (academic-commercial research pipeline)
- low participation of alumni in developing relationships and networking with the community
- insufficient promotional activities aimed at spreading information on the Faculty achievements and capacities in the community

Opportunities:

- 11 fully functional specialised laboratory units resulting from the successful implementation of the INFRA project
- community engagement through the implementation of future projects (INTERREG, R&D...)
- organising a lifelong learning program at the Faculty in the fields of construction, architecture, and geodesy with the participation of community stakeholders
- doctoral studies financing sources for company employees, with the aim of transferring knowledge and community engagement
- community engagement through strengthening work-integrated learning centres
- integration of existing urban-architectural problems of local governments into architecture and urban planning courses

Threats:

- insufficient capacity of economic operators to accept and implement innovations and scientific research results in general
- publishing research results in professional journals does not contribute to raising the scientific visibility of FCEAG researchers
- insufficient capacity of the Croatian economy to accept innovations and new solutions resulting from doctoral level research
- limited local communities' resources and discouraging current legal framework for cooperation with employers in the industry and public administration, related to motivating their employees as researchers-PhD students
- economic fluctuations in civil engineering industry

5. Mission and vision

5.1. Mission

The mission of the Faculty of Civil Engineering, Architecture and Geodesy is subject to ensuring high quality education for students of all study programs, encouraging academic and scientific excellence, and promoting science and innovation for the enhancement of civil engineering profession.

The mission of the Faculty includes the following fundamental aspects:

1. **Quality education of students:** Ensuring higher education based on fundamental, applied and interdisciplinary knowledge adapted to the contemporary modern needs of civil engineering, architecture and geodesy practices [22].
2. **Critical thinking:** Encouraging critical thinking, creativity and professional skills necessary to successfully prepare the students for future careers and active participation in society.
3. **Academic principles:** Fostering ethical values in academic society, integrity and openness to different perspectives. Supporting freedom of expression and critical thinking to create a stimulating environment for academic growth and development.
4. **Scientific research:** Encouraging research and development in the fields of civil engineering, architecture and geodesy. Contributing to the dissemination of scientific knowledge and solving key social challenges through cooperation with other scientific and educational institutions and industry partners on competitive scientific and research projects.
5. **Advancing science and innovation in the civil engineering sector:** Encouraging progress and innovation in the civil engineering sector, supported by cooperation with industry partners. We aim to reach a leading position in fundamental and applied research, development of new technologies and practices to continuously stimulate the development of civil engineering professions and their sustainability.
6. **Cooperation with the community:** Cooperation of the Faculty with the local and regional community, providing professional support, education and participation in projects contributing to the development of the county and the city of Split. Our purpose is to contribute to the sustainable development and improvement of living conditions in our environment.

Accomplishment of specific elements of the mission, and acting according to the principles of the ESG standards [23], the Croatian Qualification Framework [24] and superordinate strategic documents [1-8], the Faculty of Civil Engineering, Architecture and Geodesy aspires to become a centre of excellence in higher education, scientific research, and advancement of the civil engineering profession.

5.2. Vision

The vision of the Faculty of Civil Engineering, Architecture and Geodesy is the pursuit of establishing itself as a leading scientific and higher education institution with a significant impact on society and the profession, achieved through innovative approaches and technologies in the civil engineering sector at the regional level. Our vision is manifested in the following development elements:

1. **Continuous development of study programs:** The vision of the Faculty encompasses the constant development and improvement of study programs to ensure that our students acquire the relevant

knowledge and skills necessary for the dynamic and changing environment of civil engineering, architecture, and geodesy. We strive to ensure that our programs reflect the contemporary trends and demands of the labour market.

2. **Continuous promotion of scientific findings:** The Faculty wishes to be recognised as a centre of excellence in research and generating new scientific knowledge in the fields of civil engineering, architecture, and geodesy. We encourage scientific creativity and support researchers in their efforts to contribute to the development of new technologies, practices, and sustainable solutions.
3. **Cooperation with industry and public sector partners:** We believe that cooperation with industrial partners and the public sector is a key element in linking theory and practice. Through active partnership with leading organisations, companies, and institutions, we want to provide our students with practical experience and the opportunity to apply the acquired knowledge in the real world.
4. **Utilisation of FCEAG Laboratory:** The Faculty is dedicated to the development and maintenance of modern laboratories equipped with the state-of-the-art scientific and research equipment. FCEAG laboratories enable students and researchers to conduct advanced research, testing and analysis, fostering innovation and practical application of knowledge.

By accomplishing its vision, the Faculty of Civil Engineering, Architecture and Geodesy strives to be recognised as an innovative, relevant, and professional institution, fostering progress in the civil engineering sector and actively contributing to society and the community through its activities and impact.

6. Strategic objectives of the Faculty, activities and performance indicators

The four strategic areas delineated the four principal strategic objectives of the Faculty for the period 2023-2027. The principal strategic objectives were further elaborated into a total of 19 subgoals, and activities and performance indicators were defined for each subgoal.

Area: TEACHING ACTIVITIES

Principal objective - STRATEGIC OBJECTIVE 1. Ensuring the relevance and high quality of study programs while increasing their international recognition and increasing the effectiveness of studying

- Subgoal 1.1. Improving study programs in accordance with the needs of the labour market in Croatia and the European Union
- Subgoal 1.2. Enhancing international recognition of study programs and fostering international mobility of teachers and students
- Subgoal 1.3. Developing cooperation with work-integrated learning centres
- Subgoal 1.4. Continuous improvement of the student standard
- Subgoal 1.5. Increasing study retention rate and completion rate

Area: SCIENTIFIC AND ARTISTIC ACTIVITIES

Principal objective - STRATEGIC OBJECTIVE 2. Raising scientific and artistic excellence of the Faculty and international promotion of the results of science and arts projects and programs

- Subgoal 2.1. Achieving maximum results of scientific research work and the development of scientific research infrastructure
- Subgoal 2.2. Achieving maximum results of artistic and artistic-teaching work
- Subgoal 2.3. Developing interdisciplinary research at the Faculty
- Subgoal 2.4. Strengthening cooperation with foreign universities and laboratories and increasing the incoming and outgoing mobility of researchers
- Subgoal 2.5. Increasing the national and international visibility of scientific and artistic work

Area: INFRASTRUCTURE AND EFFECTIVE MANAGEMENT

Principal objective - STRATEGIC OBJECTIVE 3. Increasing operational efficiency, improving infrastructure resources while ensuring their sustainability, and continuous management of the quality assurance system

- Subgoal 3.1. Upgrading infrastructure resources
- Subgoal 3.2. Ensuring the sustainability of the FCEAG Laboratory by developing commercial activities
- Subgoal 3.3. Improving the Faculty operations and effective management of research and development capacities
- Subgoal 3.4. Aligning the human resources policy with the development demands and plans, motivating and enabling continuous professional development of employees
- Subgoal 3.5. Continuous improvement of the quality assurance system

Area: COOPERATION WITH THE INDUSTRY AND STRENGTHENING OF SOCIAL RESPONSIBILITY

Principal objective - STRATEGIC OBJECTIVE 4. Improving cooperation with the community and industry partners

- Subgoal 4.1. Improving the lifelong learning system
- Subgoal 4.2. Cultivating public engagement with science and the arts
- Subgoal 4.3. Developing cooperation with economic operators with the aim of joint provision of services
- Subgoal 4.4. Developing community engagement by employee participation in socially relevant projects

The strategic objectives of the Faculty are also aimed at achieving broader national and social goals.

The national strategic objectives defined by the Regulation on programme funding of public higher education institutions and public research institutes in the Republic of Croatia [3] are as follows:

1. Increasing scientific excellence;
2. Strengthening cooperation with the industry and development of national and regional identity and culture;
3. Increasing the relevance, quality and effectiveness of studying;
4. Strengthening social responsibility.

Taking into account the larger social goals, the Faculty's strategic goals also refer to the Sustainable Development Goals set by the United Nations, presented in the 2030 Agenda document [4] and shown in Figure 2. Seventeen global goals were defined with the aim of achieving social-environmental and economic-environmental balance in the world.



Figure 2. UN Agenda 2030: 17 Sustainable Development Goals

An overview of the strategic objectives of the Faculty and associated national goals and the broadest social goals set by the UN Agenda 2030 are given in Table 4.

Table 4. Strategic objectives of the Faculty in relation to the national and global goals

Strategic objective of the Faculty	National strategic objective				Global Sustainable Development Goal*
	1	2	3	4	
Area 1: TEACHING ACTIVITIES					
Principal objective 1. Ensuring the relevance and high quality of study programs while increasing their international recognition and increasing the effectiveness of studying					

Strategic objective of the Faculty	National strategic objective				Global Sustainable Development Goal*
	1	2	3	4	
1.1. Improving study programs in accordance with the needs of the labour market in Croatia and the European Union			✓		4, 8, 17
1.2. Enhancing international recognition of study programs and fostering international mobility of teachers and students			✓		4, 8, 17
1.3. Developing cooperation with work-integrated learning centres		✓	✓		4, 8, 17
1.4. Continuously improving the student standard			✓		4
1.5. Increasing study retention rate and completion rate			✓		4
Area 2: SCIENTIFIC AND ARTISTIC ACTIVITIES					
Principal objective 2. Raising scientific and artistic excellence of the Faculty and international promotion of the results of science and arts projects and programs					
2.1. Achieving maximum results of scientific research work and the development of scientific research infrastructure	✓				4, 6, 9, 11, 13, 14, 15
2.2. Achieving maximum results of artistic and artistic-teaching work	✓				4, 8, 17
2.3. Developing interdisciplinary research at the Faculty	✓				4, 6, 9, 11, 13, 14, 15, 17
2.4. Strengthening cooperation with foreign universities and laboratories and increasing the incoming and outgoing mobility of researchers	✓				4, 6, 9, 11, 13, 14, 15, 17
2.5. Increasing the national and international visibility of scientific and artistic work	✓				4, 17
Area 3: INFRASTRUCTURE AND EFFECTIVE MANAGEMENT					
Principal objective 3. Increasing operational efficiency, improving infrastructure resources while ensuring their sustainability and continuous management of the quality assurance system					
3.1. Upgrading infrastructure resources	✓	✓	✓	✓	4, 9
3.2. Ensuring the sustainability of the FCEAG Laboratory by developing commercial activities	✓	✓			4, 9
3.3. Improving the Faculty operations and effective management of research and development capacities	✓	✓	✓	✓	4, 8, 9
3.4. Aligning the human resources policy with the development demands and plans, motivating and enabling continuous professional development of employees	✓	✓	✓	✓	4, 8
3.5. Continuously improving the quality assurance system	✓	✓	✓	✓	4, 8, 9
Area 4: COOPERATION WITH THE INDUSTRY AND STRENGTHENING OF SOCIAL RESPONSIBILITY					
Principal objective 4. Improving cooperation with the community and industry partners					
4.1. Improving the lifelong learning system				✓	4, 8
4.2. Cultivating public engagement with science and the arts				✓	4, 8
4.3. Developing cooperation with economic operators aimed at the joint provision of services		✓			4, 8, 17
4.4. Developing community engagement by employee participation in socially relevant projects				✓	4, 8, 17

* The description of the goals specified by numbers is presented in the Agenda 2030 document [4] and in Figure 1.

A detailed overview of the principal strategic objectives, subgoals, activities and measurable performance indicators by strategic areas is given in the following chapters.

6.1. Teaching activities

Principal objective 1. Ensuring the relevance and high quality of study programs while increasing their international recognition and increasing the effectiveness of studying

Table 5. Goals, activities and performance indicators - teaching activities

Subgoal 1.1. Improving study programs in accordance with the needs of the labour market in Croatia and the European Union	
Activities	Measurable performance indicators
Regular review of elective and mandatory courses in all study programs according to the current needs of the labour market	The procedure of review/modification of study programs carried out once every two years At least 2 new elective courses per individual study program
Implementation of content from the area of green transition in teaching practices, with the aim of strengthening social responsibility	At least 5 final or graduate theses or doctorates on topics in the area of green transition At least 2 scientific or professional projects on the topics from the area of green transition At least 3 courses on topics related to the area of green transition
Increasing the share of practical teaching or professional training units to a higher number of courses	Introduced practical teaching in the volume of at least 1 ECTS point in at least one course per study program in a period of 3 years
Introduction of state-of-the-art teaching technologies in delivering courses	Introduce the use of virtual reality equipment in the specialised classroom in teaching processes at study programs
Learning and acquiring competencies through the participation of students in scientific and professional activities	At least 5 final or diploma theses produced as part of Science and Arts Research Logical Units (SARLUs) activities At least 5 published scientific and professional papers co-authored as part of Science and Arts Research Logical Units (SARLUs) activities
Applying for and implementing projects in the area of teaching improvement financed from national and EU funds	At least 2 applied teaching improvement projects
Development of new study programs in geodesy and geoinformatics based on recently defined qualification standards from the previous strategic period	Prepared 2 detailed study program proposals for qualifications: Bachelor of Science in Geodesy and Geoinformatics Engineering, EQF 6 Master of Science in Geoinformatics Engineering (M.Sc.GI), EQF 7
Development of qualification standards for study programs in civil engineering studies, and architecture and urban planning	Developed qualifications standard for undergraduate studies in Civil Engineering as part of the activities of the Association of Croatian Civil Engineering Faculties* Developed standard for undergraduate and graduate studies in Architecture and Urban Planning at the level of the Republic of Croatia*
Promotion of professional ethics and anti-corruption policy among students and the introduction of subjects in the field of ethics in science and the methodology of scientific and research work at all graduate level study programs	Introduced elective course in the field of ethics in science and methodology of scientific research and artistic work in all graduate study programs In cooperation with professional associations and engineering chambers, annual workshop organised with the topic of adhering to the ethical principles of the profession, i.e. social and ethical responsibilities**

Subgoal 1.1. Improving study programs in accordance with the needs of the labour market in Croatia and the European Union	
Activities	Measurable performance indicators
Continuous improvement of instruction facilities and library collections	Upgrading of PC inventory in at least one Faculty computer classroom due to the high computational resources required by new licensed software/applications Prepared and implemented annual plan for the acquisition of new information resources
Establishing guest visits programme for scientists and artists reputable at the national and/or international level	At least three visiting lectures by reputable scientists or artists per year At least seven reputable artists as visiting critics at the final public presentations of architectural and urban planning workshops per year

* "External", *sine quibus non* i.e. essential prerequisites: Adopting a consensus for the qualifications standard at the level of the Republic of Croatia through the work of the Association of Croatian Civil Engineering Faculties, i.e. the Association of Architecture and Urban Planning Studies in Croatia

** "External", *sine quibus non* i.e. essential prerequisites: Readiness of professional associations and engineering chambers to cooperate with FCEAG

Subgoal 1.2. Enhancing international recognition of study programs and fostering international mobility of teachers and students	
Activities	Measurable performance indicators
Encouraging international mobility of students and teachers	Organised Erasmus Day at FCEAG at least once a year At least 10% of teachers participating in international exchange Increased number of students participating in international exchange Increased number of signed ERASMUS agreements
Increasing the number of courses taught to incoming students within the Erasmus+ mobility programme	Increased number of courses taught to incoming students within the Erasmus+ mobility programme at all studies compared to the previous 5-year period
Development of a new study program in English	At least one detailed proposal of a study program in English prepared
Organisation of international teaching activities	Organising activities for at least one module of the FCEAG summer school At least 5 international student workshops organised independently by FCEAG, or in cooperation with reputable international art schools, in the period of 5 years
Printed materials and regular update of the website in English	Updated website in English Printed brochures in English for all study programs

Subgoal 1.3. Development of cooperation with work-integrated learning centres	
Activities	Measurable performance indicators
Increasing the number of work-integrated learning (WIL) centres and increasing the number of students receiving professional training at WIL centres	At least two agreements signed with new work-integrated learning centres The number of students who received professional training at WIL centres increased by at least 20%
Coordinating cooperation with work-integrated learning centres	Preparation of the annual report by the WIL coordinator of the Faculty Records of all forms of teaching conducted in WIL centres entered in the Faculty's information system (for the purposes of monitoring cooperation) Setting up a meeting of WIL centres representatives and Faculty coordinator at least once a year
Developing a Faculty website dedicated to WIL	Developed website with updated content
Encourage the use of WIL centres for the preparation of diploma theses and the organisation of field trips	At least 5 diploma theses created in cooperation with WIL centres over a period of 5 years Each year, at least one field trip is organised in cooperation with the WIL centres
Cooperation with WIL centres in the process of applying for and implementing professional and scientific research projects and implementing new technologies	At least three registered projects At least one completed project At least two new technological procedures implemented
Engagement of the Alumni Association in the WIL centres and mentoring system	Alumni Association involved in the WIL centres and mentoring system
Subgoal 1.4. Continuous improvement of the student standard	
Activities	Measurable performance indicators
Supporting students in various social, cultural-artistic, sports-recreational, humanitarian and social activities	At least 5% of students participate in cultural-artistic, sports-recreational, humanitarian and social activities on an annual basis At least 2 activities per year
Supporting the activities of the Student Assembly related to applications for student projects aimed at securing funding for field teaching and student workshops and conferences	At least 2 applications for student projects per year
Subgoal 1.5. Increasing study retention rate and completion rate	
Activities	Measurable performance indicators
Conducting a preparatory seminar for freshmen with the aim of instructing students on methods for successful studies	Seminar organized and conducted once a year
Annual analysis of pass rates by study programs and development of a plan and implementation of measures to increase pass rates	Prepared annual report on the conducted pass rates analysis and annual plan with measures to increase pass rates At least 35% of students accumulate more than 55 ECTS
Developing teachers' competencies through workshops and lectures with the aim of developing instructive/teaching skills	At least one workshop per year organised at FCEAG on the topic of developing teachers' instructive/teaching competences The number of teachers who participated in teacher competence development programs

6.2. Scientific and artistic activities

Principal objective 2. Raising scientific and artistic excellence of the Faculty and international promotion of the results of science and arts projects and programs

Table 6. Goals, activities and performance indicators - scientific and artistic activities

Subgoal 2.1. Achieving maximum results of scientific research work and the development of scientific research infrastructure	
Activities	Measurable performance indicators
Increasing the number and quality of published scientific papers in reputable international publications	At least 25% of annually published scientific papers indexed in the Web of Science or Scopus databases are published in journals in the first two quartiles Achieving at least 0.9 ratio of the number of published scientific papers indexed in the WoS or Scopus databases and the total number of permanently employed scientific and teaching staff
Increasing the number of new and competitive scientific research project proposals focused on applied and developmental research	At least 20 scientific research project proposals
Upgrading the FCEAG Laboratory and increasing the number of research support staff and their continuous education	Increased number of laboratory assistants, technicians, and other laboratory staff* At least 2 trainings conducted for laboratory assistants or other staff
Ensuring sustainability of research and research results through technology transfer	At least 5 project proposals involving industry stakeholders At least 20% of the research topics proposed in the Ph.D. program in Civil Engineering belong to the field of applied research At least one successful project application for applied research projects
* "External", <i>sine quibus non</i> i.e. essential prerequisites: (possible limitations) if applicable: Administrative staff job positions secured by the University of Split, the Ministry of Science and Education or other relevant sources	
Subgoal 2.2. Achieving maximum results of artistic and artistic-teaching work	
Activity	Measurable performance indicators
Increasing the number of arts research projects	At least 2 arts research projects in 5 years
Encouraging interdisciplinary artistic topics complementary to scientific research	At least 1 institutionally verified science and arts project
Upgrading facilities and material resources for artistic and teaching activities	Constructed and equipped model workshop for artistic and teaching activities and upgraded FCEAG exhibition space
Subgoal 2.3. Developing interdisciplinary research at the Faculty	
Activities	Measurable performance indicators
Setting up interdisciplinary science and arts projects (SAR projects) at FCEAG	At least 1 interdisciplinary SAR project set up at FCEAG
Encouraging scientific research involving a combination of elements from the field of construction with the fields of architecture and urban planning, or the fields of geodesy and geoinformatics	At least five papers are published covering elements from the field of construction and elements from the fields of architecture and urban planning, or the fields of geodesy and geoinformatics

Subgoal 2.3. Developing interdisciplinary research at the Faculty	
Activities	Measurable performance indicators
Applications for interdisciplinary projects involving researchers from other Croatian or foreign scientific research institutions and economic operators	At least 2 applications for projects involving researchers from other Croatian or foreign scientific research institutions and economic operators
Subgoal 2.4. Strengthening cooperation with foreign universities and laboratories and increasing the incoming and outgoing mobility of researchers	
Activities	Measurable performance indicators
Establishing the Committee for International Cooperation and development of an action plan for enhancing international cooperation	Established Committee for International Cooperation An action plan was drawn up to improve international cooperation
Increasing the number of joint doctorate agreements in cooperation with international partners that have at least equal ranking of research excellence	At least one new agreement in three years
Establishing a network of foreign partner organisations for applications of competitive international projects	Application of at least five projects with participation of foreign universities or research organisations
Establishing cooperation with foreign scientific research institutions and laboratories	Increased number of signed cooperation agreements with foreign scientific and research institutions
Subgoal 2.5. Increasing the national and international visibility of scientific and artistic work	
Activities	Measurable performance indicators
Increasing involvement in international scientific and professional organisations	Increased number of FCEAG employees involved in the work of international organisations
Motivating artists to participate in national and international competitions and exhibitions	Participation in at least 5 international exhibitions and 5 national exhibitions in 5 years; participation in 20 national and international competitions in 5 years
Organising national and international scientific and artistic conferences	At least 5 international scientific or scientific-artistic conferences organised by FCEAG in 5 years Participation of doctoral students in the organisation of the "Common Foundations" conference organised by the Association of Croatian Civil Engineering Faculties
Enhancing the quality of the International Journal for Engineering Modelling	Journal indexing in the Web of Science database
Promoting scientific research activities of the FCEAG Laboratory	Prepared FCEAG Laboratory promotional brochure Prepared laboratory equipment catalogue Developed FCEAG Laboratory website Presenting the scope of laboratory tests at scientific and professional conferences and in journals
Encouraging science and arts publishing activities	At least 3 publications of artistic or artistic-teaching research Maintained continuity of publication of the Yearbook of Architecture and Urban Planning Studies
Encouraging exhibition programmes of FCEAG	2 exhibitions of artistic and research work organised in 5 years with corresponding catalogues published
Redesign of the Faculty website	Redesigned and continuously updated website of the Faculty

Research topics within the framework of the implemented FCEAG organisational restructuring

The research topics of FCEAG belong to the field of engineering sciences in areas related to civil engineering, architecture and urban planning, as well as geodesy and geoinformatics [21]. Since contemporary social challenges also require the integration of social studies, scientific research extends to the interdisciplinary area. Sustainable development presents a major contemporary social challenge, determining several new goals especially relevant for the coastal areas of the Mediterranean. Therefore, research topics investigated at the Faculty cover sustainable construction, management of the existing built environment with a special focus on infrastructure systems and built heritage, natural resources management, and environmental protection, with an emphasis on water and sea management and protection.

At the end of September 2021, FCEAG completed the INFRA project "Implementation of Contemporary Scientific Research Infrastructure at FCEAG for Smart Specialization in Green and Energy Efficient Construction" (KK.01.1.1.02.0027), started in the second half of 2018. The project was financed by grants from the European Regional Development Fund, as part of the Call for Project Proposals "Investment in Organizational Reform and Infrastructure in the Research, Development and Innovation Sector" within the framework of the Operational Programme "Competitiveness and Cohesion 2014-2020". The total project value is EUR 11.2 million, of which 11 million were financed by grants from EU sources.

The scientific and research activities of the Faculty gained new momentum with the implementation of the INFRA project, resulting in a significant upgrade of the research equipment and a flexible restructured organisation capable of addressing social challenges by fast establishment of research groups.

With the completion of the INFRA project, the Faculty buildings A, B, and C and the facilities of the Laboratory for Seismic Testing were reconstructed and modernised. The new building of the Hydrotechnical Laboratory was built. New laboratories were formed, and a total of 11 laboratories were equipped with modern scientific and research equipment. A comprehensive organisational restructuring of the Faculty was carried out by separating scientific and teaching activities and creating a new matrix-based organisational structure (SARLU) of the Faculty.

FCEAG Laboratory is one of the organisational units of the Faculty of Civil Engineering, Architecture and Geodesy, University of Split, established for the purposes of managing the scientific research infrastructure and supporting and advancing scientific research, teaching, and professional activities. The FCEAG Laboratory consists of eleven Specialised Laboratory Units (SLUs):

- SLU - Geotechnical Laboratory
- SLU - Hydrotechnical Laboratory
- SLU - Laboratory for Building Materials
- SLU - Laboratory for Seismic Testing
- SLU - Structures Laboratory
- SLU - Laboratory for Numerical Modeling
- SLU - Laboratory for Geographic Information Systems and Decision Support Modeling
- SLU - Laboratory for Geodesy and Geoinformatics
- SLU - Laboratory for Implementing Contemporary Architectural Technologies
- SLU - Transportation Laboratory
- SLU - Measuring Station for Wind Energy

The organisational restructuring produced an organisational structure based on a modern project-orientated approach combined with the core and traditional functions of the scientific and research activities of FCEAG. The organisational structure of scientific research activities is determined by the following:

- organisational units – 11 science and arts logical units (SARLU), the Office for research and development, joint management of research and development capacities (R&DO) and the FCEAG Laboratory
- a number of science and arts projects (SAR projects) with corresponding project activities

The new organisational model for FCEAG scientific activities is presented in Figure 3. SAR logical units with corresponding laboratory equipment represent the Faculty research resources engaged in SAR projects. SAR projects combine activities in one or more research topics, with research results focused on providing solutions to given social challenges.

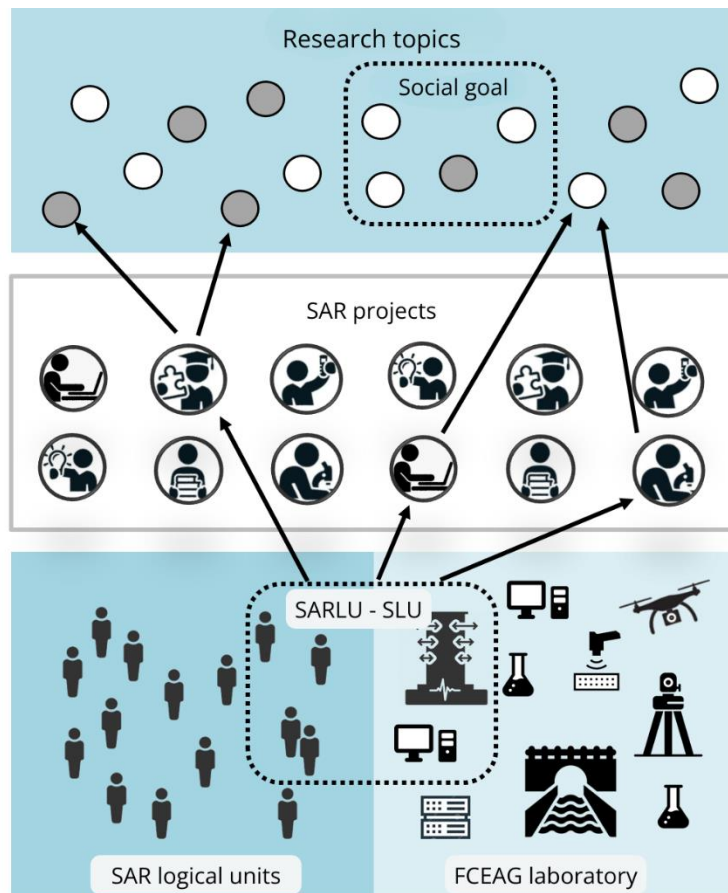


Figure 3. FCEAG flexible research system model

SAR projects represent the foundation of competitive development of scientific research activity based on the utilisation of FCEAG Laboratory resources and flexible research work of project teams within specific SARLU, in pursuit of the set strategic objectives of FCEAG. Setting up SAR projects allows the creation of research groups composed of employees from different departments.






























The SARLU model was established for the purpose of integrating and implementing thematically cognate research, topic-focused management of scientific research and artistic activities, and the available human, financial, material and other resources of the Faculty. The units were formed on the basis of long-term scientific and research work in specific areas of civil engineering, architecture, and geodesy. The current list of SARLUs is as follows:

- SARLU for Geotechnical Research
- SARLU for Hydrotechnical Engineering
- SARLU for The Research of Building Materials
- SARLU for Seismic Testing
- SARLU for the Testing of Structures














- SARLU for Numerical Modeling
- SARLU for GIS Research and Decision Support Modeling
- SARLU for Geodesy and Geoinformatics
- SARLU for the Implementation of Modern Technologies in Architecture
- SARLU for Road Design and Road Infrastructure Management
- Science and Arts Research Logical Unit (SARLU) for the Research of Wind Energy

The scientific research topics and the corresponding sustainable development goals related to the research focus are presented in Table 7. A more detailed description of each topic is provided in the FCEAG Strategic Programme of Scientific Research for the period 2020 - 2025 in the field of engineering sciences and the interdisciplinary field of science [9], [10].

Table 7. Research topics and focus on sustainable development goals

Topic title	Sustainable development goal
Topic 1: Research in geotechnical engineering	 
Topic 1.1: Field measurements	
Topic 1.2: Determining soil properties and stress under structures in seismically active areas	
Topic 1.3: Soil and rock testing for construction purposes from an environmentally sustainable perspective	
Topic 1.4: Soft rocks and weathering	 
Topic 1.5: Application of advanced technologies in geotechnical engineering	
Topic 1.6: Unsaturated geomaterials	 
Topic 1.7: Coastal resilience and improving sustainable management in response to climate change	 
Topic 2: Research in hydrotechnical engineering	   
Topic 2.1: Defining spatial and temporal data of the coastal zone	 
Topic 2.2: Research in karst aquifers in the coastal area	 
Topic 2.3: Applied research related to open streamflows	 
Topic 2.4: Wind tunnel research of impact of wind load on structures	
Topic 2.5: Synergy framework for marine research	
Topic 2.6: Synergy framework for environmental research	 
Topic 3: Building materials research	
Topic 3.1: Improving the properties of sustainable cement composite	
Topic 3.2: Investigating the quality impact of Spanish broom (<i>Spartium junceum</i> L.) fibres and cement composite	

Topic title	Sustainable development goal
Topic 3.3: Determining properties of biocomposites and their application in construction	
Topic 4: Research in the field of seismic testing	 
Topic 4.1: Seismic resistance testing of different types of structures (buildings, bridges, towers, tunnels, dams, etc.)	 
Topic 4.2: Investigation of the behaviour of materials and structures using an impact tower	
Topic 4.3: Investigation of seismic base isolation	
Topic 4.4: Investigation of the behaviour of retaining wall during an earthquake	
Topic 4.5: Testing seismic behaviour of stone walls and stone masonry houses	
Topic 4.6: Seismic and dynamic loading	
Topic 5: Testing of structures	
Topic 5.1: Testing of metal structures elements	
Topic 5.2: Investigation of the behaviour of parts of structures exposed to high temperatures	
Topic 5.3: Research of structures built from other materials	
Topic 5.4: Research of concrete structures	
Topic 5.5: Integral approach to safety analysis in case of fire in closed spaces	
Topic 5.6: Application of hardwood for the production of glued laminated beams (GLULAM)	
Topic 5.7: Development of technology for permanent monitoring of structures	
Topic 5.8: Monitoring of ancient buildings - MANGRA	
Topic 6: Research in the field of numerical modeling	
Topic 6.1: Development of new numerical models and analysis of complex behaviour mechanisms in mechanics of structures and materials	
Topic 6.2: Development of numerical algorithms for modelling problems in structural mechanics using spline functions	
Topic 6.3: Development of methodology for parameter estimation in fracture propagation problems under extreme mechanical loads	
Topic 6.4: Computer spatial simulations and data management	
Topic 6.5: Modeling and assessment of single and multi-hazard risks of natural disasters	

Topic title	Sustainable development goal
Topic 7: GIS research and decision support modeling	
Topic 7.1: Urban renewal planning (land consolidation) – DSS in construction management	
Topic 7.2: Support for the management of energy efficiency building renovation – DSS in construction management	
Topic 7.3: Management of renovation of historical buildings – DSS in construction management	
Topic 7.4: Management of "resilience" of architectural heritage structures – DSS in construction management	
Topic 7.5: Decision support in road infrastructure management – DSS in construction management	
Topic 7.6: Decision support in the management of maritime domain – DSS in construction management	
Topic 8: Research in geodesy and geoinformatics	
Topic 8.1: Creation of 3D buildings models with application in the protection of cultural heritage, building cadastre, utility cadastre, etc.	
Topic 8.2: High-precision measuring system for monitoring deformations (auscultation) of structures (e.g., dams)	
Topic 8.3: Research in geoinformatics: GIS and decision support modeling in construction	
Topic 9: Research and implementation of modern technologies in architecture	
Topic 9.1: Research on the implementation of modern materials and technologies in architecture	
Topic 9.2: Research in implementation of modern technologies and materials in the protection of architectural heritage	
Topic 9.3: Investigating application of modern materials and technologies in architecture	
Topic 9.4: Models of reconstruction and revitalization of post-war housing blocks	
Topic 9.5: History and theory of modern architecture and urban planning	
Topic 9.6: City development in the context of environmental issues	
Topic 10: Research in the field of road design and road infrastructure management	
Topic 10.1: Road design from the perspective of safety and cost-effectiveness	
Topic 11: Wind energy research	 
Topic 11.1: Safety related to the impact of extreme wind load	
Topic 11.2: Effect of wind energy and climate change in civil engineering	 

6.3. Infrastructure and effective management

Principal objective 3. Increasing operational efficiency, improving infrastructure resources while ensuring their sustainability and continuous management of the quality assurance system

Table 8. Goals, activities and performance indicators – infrastructure and effective management

Subgoal 3.1. Upgrading infrastructure resources of the Faculty	
Activities	Measurable performance indicators
Upgrading teaching and working facilities	At least two activities related to the renovation and upgrade of teaching and working facilities Renovation and modernisation of the library
Continuous upgrade of information and communication equipment	Software and hardware upgrade of the integrated IT system Increased server capacity
Increasing energy efficiency and use of renewable energy sources	Roof renovation and installation of solar panels on at least one roof surface
Subgoal 3.2. Ensuring the sustainability of the FCEAG Laboratory by developing commercial activities	
Activity	Measurable performance indicators
Increasing the number of professional projects with planned utilisation of FCEAG Laboratory equipment	At least 20 professional projects completed involving the use of FCEAG Laboratory equipment
Encouraging the accumulation of working capital for financing regular and extraordinary equipment maintenance	Secured additional funds for the work of specialised laboratory units through self-generated working capital
Accreditation of individual specialized laboratory units	Accreditation of laboratories according to HRN EN ISO/IEC 17025 standard, accreditation of test methods used as part of FCEAG activities
Drafting of regulations on the use of scientific research equipment and updating the list of services the Faculty can provide to economic operators	Drafted regulations on the use of scientific research equipment, updated equipment catalogues and a list of services that can be offered to economic operators
Development of a website dedicated to scientific research equipment and its utilisation possibilities	Created and updated website
Subgoal 3.3. Improving the Faculty operations and effective management of research and development capacities	
Activity	Measurable performance indicators
Establishing digital monitoring of the process of applying for and implementing scientific research projects	Established system for monitoring scientific research project application and implementation as part of the integrated information system for monitoring Faculty activities
Strengthening the role and human resources of the Office for research and development, joint management of research and development capacities and development of the Office for scientific research and international cooperation	At least one person permanently employed in the Office for research and development, joint management of research and development capacities * Established Committee for International Cooperation and prepared action plan for enhancing international cooperation At least one signed international cooperation agreement with foreign institutions and companies per year

**Subgoal 3.3.
Improving the Faculty operations and effective management of research and development capacities**

Activity	Measurable performance indicators
	Increased number of FCEAG employees involved in the work of international organisations

* "External", *sine quibus non* i.e. essential prerequisites: (possible limitations) if applicable: Administrative staff job positions secured by the University of Split, the Ministry of Science and Education or other relevant sources

**Subgoal 3.4.
Aligning the human resources policy with the development demands and plans, motivating and enabling continuous professional development of employees**

Activity	Measurable performance indicators
Defining the necessary human resources for the planning period of 5 years based on the Faculty's development projections in accordance with the strategic documents	Prepared needs analysis for developing human resources with the aim of improving the teaching, scientific and research activities, and the international recognition of the Faculty
	Developed strategic plan for priority employment specifically for departments, SAR logical units, FCEAG Laboratory and administrative staff
Ensuring the development of competences and further professional development of all employees in their field of activity	At least 50% of employees participated in workshops, training courses, lectures
	At least 30% of employees participated in professional conferences
Development of the employee reward system: for special achievements in science, for special achievements in teaching, for special achievements in the professional work, for special achievements in the development of Faculty infrastructure	Further development and improvement of the reward system for special achievements in science
	Developed reward system for special achievements in teaching
	Developed reward system for special achievements in the professional work
	Developed reward system for achievements in the development of Faculty infrastructure

**Subgoal 3.5.
Continuous improvement of the quality assurance system**

Activity	Measurable performance indicators
Adopting and monitoring the implementation of strategic documents based on established indicators (in accordance with ESG standards and higher-level strategic documents) and publishing the documents	Adopted and published strategic documents of the Faculty and corresponding operational (action) plans and annual reports
Harmonisation of legal acts with statutory regulations and university documents	Adopted and published legal acts of the Faculty
Implementation of quality assurance and quality enhancement activities established by the Regulations and Quality Assurance Manual	Adopted and published reports on the work of the Quality Enhancement Committee and the Internal Audit Committee
Regular evaluation of quality through cyclical external and internal evaluations	Adopted and published Report on conducted evaluations and procedures/reports based on received recommendations at the end of each cycle

6.4. Cooperation with industry and strengthening of social responsibility

Principal objective 4. Improving cooperation with community and industry partners

Table 9. Goals, activities and performance indicators - cooperation with the industry and strengthening social responsibility

Subgoal 4.1. Improving the lifelong learning system	
Activity	Measurable performance indicators
Implementing and promoting lifelong education programs	At least one annual lifelong education program organised and published on the Faculty website and social networks
Developing cooperation with the Alumni Association and professional chambers and associations in developing lifelong learning programs	Alumni associations and professional chambers and associations involved in developing lifelong learning programs*
Developing cooperation with educational institutions to take joint and synergetic action aimed at increasing the quality and efficiency of the educational system	Increased number of activities carried out with educational institutions and educational associations**
* "External", <i>sine quibus non</i> i.e. essential prerequisites: The readiness of professional associations and engineering chambers to cooperate with FCEAG	
** "External", <i>sine quibus non</i> i.e. essential prerequisites: The readiness of educational institutions and educational associations to cooperate with FCEAG	
Subgoal 4.2. Cultivating public engagement with science and the arts	
Activity	Measurable performance indicators
Organising popular lectures in science, technology, and the arts	At least one activity per year
Participating in the Science Festival	At least one activity per year at the Science Festival in the field of construction, architecture and geodesy
Organising FCEAG Open Doors Days	FCEAG Open Doors Days organised once a year
Organising FCEAG Science Day in the laboratories	FCEAG Science Day organised once a year in the laboratories
Subgoal 4.3. Developing cooperation with economic operators with the aim of joint provision of services	
Activity	Measurable performance indicators
Building capacities for implementing projects in cooperation with economic operators	Established Committee for professional work Prepared cooperation plan with the community and the industry Increased number of employees in the Office for research and development, integrated management of research and development capacities *
Contributing to the work of specialised forums for networking and connecting research and companies	Involvement in at least one specialised forum

Subgoal 4.3.**Developing cooperation with economic operators with the aim of joint provision of services**

Activity	Measurable performance indicators
Increasing the number of collaborations with economic operators, public companies and government institutions, and cultural and educational institutions	At least 10 formal collaborations with economic operators and cultural and educational institutions**
Increasing the value of service projects for industry and public bodies	Revenues from projects increased by at least 5% compared to the previous reference period Increased number of contracted service projects for industry and public bodies in the area of culture and education**
Dissemination of the results of cooperation with the community and economic operators to the general public	Dissemination of project results on social networks and website; organisation of at least one workshop or conference

* "External", *sine quibus non* i.e. essential prerequisites: (possible limitations) if applicable: Administrative staff job positions secured by the University of Split, the Ministry of Science and Education or other relevant sources

** "External", *sine quibus non* i.e. essential prerequisites: The readiness of economic operators, and public bodies and cultural and educational institutions to cooperate with FCEAG

Subgoal 4.4.**Developing community engagement by employee participation in socially relevant projects**

Activity	Measurable performance indicators
Involving employees in the processes of preparing strategies and development projects and other projects of public interest	At least 2 formal forms of cooperation with government administration and public sector bodies
Active participation of employees in the work of professional and artistic associations	At least 10 participations of teachers in the work of professional and artistic associations, in judge panels of architecture competitions and in committees awarding relevant artistic awards, in the period of 5 years
Supporting local and regional self-government units through teaching activities	At least 3 cooperation agreements signed with units of local and regional self-government, initiated based on topics of architectural and urban planning workshops
Involving employees in the process of developing standards and technical regulations at the level of the Republic of Croatia	At least 3 participations of teachers in the development of standards and/or technical regulations
Involving employees and students in the organisation and implementation of humanitarian activities organised by the local and broader social community	Involvement of Faculty employees and students in at least one humanitarian activity per year

7. Documents

The following priority documents and references were used in the development of this Strategy:

- [1] EU Strategy Europa 2020 ([Europe 2020: A Strategy for Smart, Sustainable and Inclusive Growth](#))
- [2] National Plan for the Development of the Education System until 2027, [National Plan 2027](#)
- [3] Regulations on programme funding of public higher education institutions and public research institutes in the Republic of Croatia, [programme funding](#)
- [4] Transforming our world: the 2030 Agenda for Sustainable Development, [UNAGenda2030](#)
- [5] Strategy for Education, Science and Technology of the Republic of Croatia (October 2014), [link](#)
- [6] Smart Specialisation Strategy (S3) 2029, [S3 strategy](#)
- [7] Strategy of the Agency for Science and Higher Education 2021 - 2025, [ASHE Strategy 2021-25](#)
- [8] University of Split Strategy 2021 - 2025, [UNIST Strategy](#)
- [9] FCEAG scientific and research strategy in the field of engineering sciences 2021-2025, [ZIS 2021-2025 TZ](#)
- [10] FCEAG scientific and research strategy in the interdisciplinary field of science 2021-2025, [ZIS 2021-2025 IPZ](#)
- [11] FCEAG Strategy 2018-2022 (November 2017), [Strategy 2018-2022](#)
- [12] ASHE Report on the Reaccreditation of FCEAG from September 2018 (visit in March 2018), [link](#)
- [13] Accreditation recommendation of the Agency for Science and Higher Education in the FCEAG reaccreditation procedure (January 2019), [link](#)
- [14] Report of the Expert Panel on the Reaccreditation of the University Postgraduate (Doctoral) Programme in Civil Engineering, Faculty of Civil Engineering, Architecture and Geodesy, University of Split (date of visit 03 June 2016), November 2016, [link](#)
- [15] ASHE accreditation recommendation in the procedure for reaccreditation of postgraduate (doctoral) study in civil engineering, February 2017, [link](#)
- [16] Five-year action plan for quality enhancement in accordance with the recommendations of the expert committee from the Final Report of the expert committee for FCEAG (July 2019) [link](#)
- [17] Action plan for quality enhancement of the postgraduate (doctoral) study in Civil Engineering (February 2018), [link](#)
- [18] Quality Assurance Policy of the Faculty of Civil Engineering, Architecture and Geodesy in Split, June 2017, [link](#)
- [19] <http://gradst.unist.hr/istrazivanje/projekti/projekti>
- [20] <https://www.croris.hr/ustanove/ustanova/61>
- [21] <http://gradst.unist.hr/international-journal-for-engineering-modelling>
- [22] <http://gradst.unist.hr>
- [23] Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG), enqa.eu/esg/
- [24] [Croatian Qualifications Framework Act](#), (Official Gazette 22/13, 41/16, 64/2018, 47/2020, 20/2021)
- [25] University of Split Strategy 2030 / Working Materials

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Dean:

Associate Professor Neno Torić, Ph.D.

I, Jelena Madunić, court interpreter of English language, as appointed by the Republic of Croatia Ministry of Justice and Public Administration, Ref.No.: 514-03-03-03/01-23-06 of 26 May 2023, do hereby certify that the above translation is a faithful and complete translation of the original document written in Croatian language.

Date: 7 May 2024, cert.no. 19/2024

